



The  
**Imperial Forestry Institute**  
University of Oxford

NINETEENTH ANNUAL REPORT

1942—43

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# UNIVERSITY OF OXFORD

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## NINETEENTH ANNUAL REPORT OF THE IMPERIAL FORESTRY INSTITUTE ACADEMIC YEAR, 1942-43

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*Teaching.* Owing to war conditions the only students under instruction were the Colonial Forestry Scholars, four attending the Institute, two of them being forestry graduates, the other two being graduates in Botany. Special courses were arranged for the former pair, whilst the latter did the normal first year's work in forestry; they were rather handicapped in comparison with their predecessors by having taken only the shortened degree courses of the current emergency regulations. These students went to their military training at the end of the year before going to the Colonies for their 'apprentice tour.' There was also one candidate for B.Sc. and one for D.Phil. working under the supervision of the Professor.

As last year, practical work was done in the Easter and Long Vacations in the Forest of Dean, New Forest and Chiltern beechwoods. Excursions were made during the Summer Term to Forestry Commission and private woods and sawmills. The Institute is again indebted to the Forestry Commission and the owners and staff of the Hampden and other Estates for the facilities kindly extended. More time was spent by the students at the Forest Products Research Laboratory at Princes Risborough than in previous years owing to the emphasis inevitably laid on the Utilisation aspects of forestry under war-time conditions, and our thanks are due to the Director and his staff for their valuable and much appreciated assistance.

*Staff.* There were no changes of staff during the year, but Mr. Foggie's period of secondment expired at the end of it. Arrangements were made for Mr. W. J. Lambert, formerly of the Indian Forest Service, to take his place, and the Institute is fortunate in being able to secure the services of a person with qualifications so well suited to its requirements in the subjects concerned, *viz.* mensuration and management. Colonel Lloyd remained with the Royal Engineers, but has been able to keep in touch by visiting the Institute from time to time.

*Committee for Forestry.* During the year, the Committee for Forestry considered a report on the future policy of the Institute drawn up by a sub-committee. The report was adopted with certain modifications, but it was considered necessary to keep it pending the expected publication of the views and proposals of H.M. Forestry Commis-

sioners on Post-war Forestry Policy in this country. The Commission's report was issued as a White Paper (Cmd. 6447) and was debated in the House of Commons on 6/7/43 and in the House of Lords on 29/7/43. It includes sections on education and research which particularly concern the Institute, but as it did not appear to necessitate any basic alteration in the proposals made in the Committee's report, the latter was formally adopted and forwarded to the University for consideration.

The chief recommendations made include the strengthening of the staff to deal more adequately with the subjects of Economics and Forest Soil Science, the appointing of a biometrician in the University to meet the needs of all the biological departments, and the raising of the status of Forestry from a Pass to an Honours School. The principle recently adopted for the Colonial Forest Service of interpolating a period of practical training ('apprentice tour') in the University course is recommended for general application for Government Forest Services. Whilst special attention is to be given as hitherto to post-graduate work, undergraduate courses will be continued if required for forestry in Britain (as appears likely), and the need of closer co-operation with the Forestry Commission in research is stressed. It is recommended that the material for a research team adequate to undertake any forestry problem other than utilisation should be available at the Institute; touring colonial forests by members of the Institute staff and visits to the Institute by forest officers should be further facilitated; and that the branch for Forest Entomology should be retransferred from the Hope Department of Entomology to the Institute. It is hoped that Wytham Woods, which have recently come into the possession of the University, may be made available for demonstration and practical training, especially in forest management, under the direct control of the Department.

To meet the additional expense involved in these improvements, it is recommended that the University, the Colonial Office and the Forestry Commissioners should all be asked to increase their present contributions, raising the present income of £11,080 per annum to £20,000.

*Research, etc.* The staff has been unable to undertake any additional war-work during the year, but Messrs. Day, Jones and Foggie all gave much time to the working up of the data collected in the last two years for the Forestry Commission in the areas felled to meet war-time needs; field work of a similar nature was continued by two of the Commission officers, one of them being Mr. J. M. B. Brown, till recently Assistant Entomologist at the Institute. The final report on this work is practically ready, but the large amount of clerical labour involved in its compilation has still prevented it from being completely finished. Mr. Day has continued various investigations in close co-operation with the Forestry Commission's Research Officer, the Professor joining them on some tours of inspection. The Institute



staff has also worked with Mr. C. G. T. Morison, Reader in Soil Science, on the practical testing of a method of soil survey by sampling in the Commission's Forest of Mynydd Ddu. The Professor has continued to be associated with the Woodland Census of the Home Timber Production Department, but has handed over the direction of the field staff to the Department; he has also served on the Advisory Board of the Forest Products Research Laboratory of the Department of Scientific and Industrial Research, the Advisory Committee on Forest Research of the Forestry Commission, and the Executive Committee of the War Biology Committee. Since the end of the year under report, the subject of forestry training in Britain has been discussed at a number of meetings with the Forestry Commission and the Professors of Forestry of other Universities.

In January, a meeting was organised to discuss Forest Census methods with officers concerned with this work serving in the Forestry Units of the Royal Engineers. This opportunity of making contact with many Dominion foresters from Canada, Australia and New Zealand was very welcome, and it is hoped that other such meetings may be possible.

### SILVICULTURE

Dr. E. W. Jones continued in charge of this section and gave courses of lectures and demonstrations covering the new syllabus for first-year work. He was present on the excursions to various woods in reach of Oxford and during the working plan and other field work in the New Forest, Forest of Dean and Chilterns.

Work has continued on the ecological data collected in the war felling areas of 1940 and 1941, the data collected by the Bangor, Bristol, Newcastle and Scottish parties having been examined. The study of conifer and oak regeneration in the New Forest has continued, additional data having been collected in the course of instructional work.

A start has been made in studying the relation of the lichen flora of tree trunks to smoke in the Forestry Commission woods near Selby, Yorks: development of hardwood plantations there has been disappointingly slow and the reasons for this are being sought. An account of the sycamore for the Ecological Society's Biological Flora has been completed.

The Professor and several members of the staff took part in a symposium of the Ecological Society and the Forestry Societies to discuss the relation between ecological trends and silvicultural practice with special reference to a recently published paper on the subject by Sir Roy Robinson.

Mr. R. G. Sanzen-Baker, Research Officer for England and Wales, continued to be stationed at the Institute. In collaboration with Mr. Day considerable progress has been made in the enquiry on the causes of die-back in young plantations of European larch; it has been pos-

sible to carry out field work during the autumn and spring, and a summary of provisional conclusions has been prepared. Work on this project continues, and it is hoped to analyse the accumulated data during the winter.

The two nurseries at Kennington and Bagley Wood were maintained by the research staff of the Forestry Commission for the investigation of such problems as the maintenance of nursery fertility, salvage of over-grown nursery stock, seed storage and seedbed covering. Special attention was also given to the mycorrhizal equipment of the plants raised in the two nurseries.

Other investigations included the vegetative propagation of both hardwoods and conifers; such species as Norway spruce, *Sequoia gigantea* and *S. sempervirens* are being successfully propagated from cuttings. Studies in the preparation and properties of composts from various materials such as bracken, sawdust, hop-waste and Molinia grass have been continued. Members of the Institute staff have co-operated in some of these projects.

The nurseries and experiments in progress were as usual useful for instructional purposes, and demonstrations were arranged by the Forestry Commission staff as required.

## MENSURATION AND MANAGEMENT

*Instruction.* The syllabus for the first year's work in both mensuration and management was covered by Mr. A. Foggie. No normal second year courses were called for, but the two Colonial Scholars who were graduates in forestry were given special instruction in advanced mensuration. A course on statistical method as applied to mensuration was given to all students in the Michaelmas Term.

Practical instruction was given in Bagley as in previous years. The first year forestry men remeasured the Japanese larch sample plot for which the record now covers twenty years. The forestry graduates laid out a new sample plot in a small area of natural regeneration of oak.

During the Easter vacation, the first year forestry students spent four weeks in the High Meadow Woods preparing Part I of a working plan. The forestry graduates spent a fortnight in the same forest studying an area for the preparation of a planting plan based on the site types differentiated.

In the summer a week was spent in the Hampden Woods in the Chilterns and was mainly devoted to practical exercises in Yield Regulation. The science graduates worked on an area to be treated under the Group Regeneration system, determining and marking the yield for a section of the regeneration area. The forestry graduates enumerated part of a compartment to be worked under the Group Selection system, calculated the yield in several ways and marked a felling based on the eleven-year cycle applied in these woods.



*Research and Other Work.* Mr. Foggie analysed the data from the permanent sample strip in the Hampden beech-woods laid out in 1914, and determined the volume increment and the average rate of girth growth of the dominant trees; the object of the latter was its possible bearing on a method suitable for deriving growth curves for tropical trees devoid of annual rings. A good deal of time was devoted to further check, classification and analysis of the field data collected in the previous two summers by the University parties working in war-felling areas under the project financed by the Forestry Commission.

Data of larch plots measured in connection with the current Census of Woodlands were kindly made available by the Census Branch of the Timber Production Department and were used to check the provisional stand table for larch prepared in the previous years. This check showed that the provisional table was based on insufficient data. From both sets of data and further data from the census records it is hoped to prepare a more reliable table.

During the course of preparation of lectures on statistics, special attention was paid to methods of analysis applicable to Strip Survey Sampling and the assessment of errors of Local Volume Tables.

### STATISTICS

As decided last year, teaching of statistical analysis of data was restricted to the simplest principles as applied to mensuration data and so was undertaken by Mr. Foggie. The possibility of the appointment by the University of a biometrician in the Institute of Statistics to advise the biological departments and give necessary instruction in the subject is being investigated and will, it is believed, receive general support.

### SOIL SCIENCE

Mr. Morison, Reader in Soil Science, and Mr. G. R. Clarke gave the usual courses of lectures and practical instruction, which again included several days' field work in High Meadow Woods, where soils were mapped in connection with working plan and planting programme work. This work was preceded by a visit to the Black Mountain, Monmouthshire, where methods of extensive survey were discussed and applied. The data collected by the University parties in felling areas were further examined and summarised.

### TROPICAL FOREST BOTANY

Mr. Brenan continued his work on the annotated check list for Tanganyika Territory, which is approaching completion. In connection with this, a visit of a fortnight was made to the Royal Botanical Gardens, Kew. Checking of determinations of older Tanganyika Territory collections was done extensively and numerous corrections made which were duly communicated to the institutions from which the specimens had been received.

The Forest Herbarium will remain at the Institute till accommodation is available in the new Botanical Department building. Mr. Hoyle, the Curator, gave the usual lectures and demonstrations during the year. Additions to the Herbarium only amounted to 200 from the African Colonies. The poisoning of all specimens in the Herbarium has now been completed and routine procedure will ensure that all accessions are adequately poisoned before incorporation. Considerable progress has been made in mounting and labelling.

A paper on the vegetation types of the Niger Colony by Mr. Fairbairn was prepared for the press and will appear as Institute Paper No. 23. A short paper by Mr. Gunther on Mora Forest in Trinidad has also been published.

### FOREST PATHOLOGY

Mr. W. R. Day continued in charge of the section with Mr. F. H. Jones as laboratory and field assistant. The Assistant Mycologist, Mr. T. R. Peace, remained absent, having been posted by the Forestry Commission as a District Forest Officer.

*Teaching.* The usual courses of instruction and practical work were given in forest pathology and hygiene.

*Research. Analysis of Data from Felling Areas.* Some further progress has been made with regard to this, but pressure of other work has prevented an adequate amount of time being spent on it. A further examination of the butt rot data shows that in European larch plantations the proportion of sound trees tends at least locally to increase as the proportion of the total height occupied by the crown becomes larger. This suggests that one fundamental reason for the high proportion of rotted butts frequently observed in larch plantations is a lack of adequate thinning. This fits in with the hypothesis put forward in the Preliminary Report on Butt-rot previously issued that its occurrence is largely made possible by excessive fluctuations in the moisture content of the soil. The work also demonstrated the expected tendency for the proportion of sound trees to decrease with increasing age.

*The Silviculture of European Larch.* Some further field work was carried out in collaboration with Mr. Sanzen-Baker in the Easter Vacation, but no such work was possible during the Summer Vacation of the year under report. A summary of conclusions to date was submitted to the Forestry Commission during the year. There is a considerable body of data awaiting detailed analysis, and it is hoped to find time to begin this during the coming winter.

*Soil Survey.* Mr. Day has collaborated with the Reader in Soil Science in a study of the statistical aspects of a soil survey carried out in Mynydd Ddu Forest, Monmouthshire. Mr. F. H. Jones, together with Mr. Nimmo (whose services were lent by Mr. Sanzen-Baker), made observations of height growth of the trees and also recorded



other silvicultural and pathological observations. Analysis of the data is being taken in hand, and it is hoped to prepare a report on the growth of the different species on the various soil types differentiated in the survey. This work is considered important as being related to the proposed development of the study of forest soils.

*Other items of interest.* An attack of *Melampsora pinitorqua* on Scots pine was discovered in Kent by Mr. Peace and confirmed by Mr. Day. It is believed to be local and not of serious extent. An isolated example of *Peridermium cornui* was seen on a Scots pine near Thetford. *Adelopus gaumanni*, one of the causes of needle-cast on Douglas fir, was found to be generally distributed in forests visited throughout Wales. So far there is no sign of serious damage occurring, but the plantations undoubtedly need watching. The Easter tour was made at a time when die-back was actually taking place in some of the European larch plantations affected by disease, and in fact was conspicuous. Most of this die-back occurred owing to the girdling of side twigs or branches, the girdling very often occurring at places where there was no canker development. Frost is believed to be the fundamental cause of this girdling, but its full development has never been watched in the field; this is one of the things which need to be done.

Some preliminary injections with salt solutions were made in European larch showing abnormal leaf colorations in Tubney Woods near Oxford. The results suggest that a potash deficiency may sometimes occur there, an improvement in size and colour being obtained on the injected shoots. It is proposed to repeat this work next year if possible.

A meeting of the Phenological Committee of the Royal Meteorological Society was attended at the request of the Secretary. The help of those professionally interested in phenological work was asked for by the Committee. As a consequence the value of phenological work in forestry was discussed by the Professor and staff at the Institute, and a report of the conclusions will be made to the Phenological Committee.

Methods of observation of the abundance of seed crops on oak and beech were also discussed by the Committee, and this subject will be looked into. The great desideratum is a quantitative forecast of the probable size of the crop. The information is needed immediately in connection with the control of wood pigeons, but a successful solution of the problems could also be of obvious use in forestry.

## FOREST ENTOMOLOGY

Dr. Chrystal, of the Hope Department of Entomology, gave the usual first year course in Forest Zoology during the Hilary and Trinity Terms.

He also continued the scheme which had been started during the summer of 1942 of arranging a course in Forest Entomology for the Foresters' School at Parkend, Forest of Dean. A complete collection

of teaching material was prepared and taken down to the school in the autumn of 1942. Three visits were made to the school during the year, October and December, 1942, and May, 1943. During that period good progress was made, and it was hoped that the scheme would become permanent. Unfortunately, the pressure of war conditions finally rendered it impossible for the Forestry Commission to keep the school open during the remainder of the war, and it was closed down at the end of June. So, for the moment, the scheme is in abeyance, but it is hoped to restart it after the war.

Dr. Chrystal has been engaged during 1943 on research work on *Adelges cooleyi* on the Douglas fir in Tubney Wood, near Oxford.

The work was planned as the beginning of a comprehensive study of the Adelgides and their natural enemies, with their distribution and relations to conifers throughout Great Britain. The species feeding on Douglas fir was selected to begin with, as its widespread distribution throughout the country in plantations of Douglas fir had raised the question as to how far the attack of the insect was seriously affecting the cultivation of the tree.

Work was begun on the plantation early in April, and a sample of approximately half the trees on a part of the area were selected for detailed work and duly labelled. It soon became apparent that there was a fairly heavy attack of the *Adelges* more or less evenly spread throughout the area. With the *Adelges* there was also present a good population of three species of Coccinellid beetles, viz. *C. 7-punctata*, *Exochomus 4-pustulatus* and *Adalia obliterata*. Detailed survey of the individual trees was begun early in May, some twenty-five trees being studied in this manner. From these surveys information was obtained on the habits of the predators, and on the parasitism of one of them, *C. 7-punctata*, by a Braconid parasite which, although previously recorded in this country and well known in Europe and America, has not hitherto been recorded as associated with its host in Britain. A study of these predators has also been made throughout the season. Detailed descriptions of the larvae of the principal species are being made to form the basis of what will eventually be a complete record of the larvae of all Coccinellid species found in association with *Adelges*. These descriptions will be made so that the larvae can be easily identified in the field.

The great intensity of attack on the current shoots of the year was marked by the amount of 'blotched' discoloration present on the needles. This effect is thought to be only temporary in nature, and a close watch on particular trees is being kept to determine this.

It has proved necessary to attempt to classify the trees into phenotypes and to correlate these with intensity of *Adelges* attack, and similar investigations are needed on plantations in other areas. During the present season, only one area has been worked upon, but it is hoped that next year it will be possible to extend the scope of observations to include other areas in different parts of Britain. It is noteworthy, for



example, that the gall-stage of the insect has now appeared in the North of England, and it will be necessary to visit some of these areas to study this next spring.

### WOOD STRUCTURE

Dr. L. Chalk, who continued in charge of this section, gave the courses required for the first year's work under the new syllabus and for the Forestry graduates.

Progress with the research on the systematic anatomy of dicotyledonous woods, referred to in previous reports, was satisfactory under the circumstances. Preliminary drafts were completed for a further eighteen families.

Approximately sixty identifications were carried out during the year, most of these being undertaken at the request of the Colonial Forest Resources Development Department.

Very few additions were made to the wood collection.

### ECONOMICS

Mr. Day again lectured in this subject. No research in connection with it is possible at present, but a certain amount of discussion has taken place in which the necessity of costing research has been urged in order to provide an adequate check of the financial efficiency of various methods of treatment and management. The importance of this aspect of economics in connection with education was referred to last year, and the need for a member of the staff able to devote all or most of his time to forest economics becomes increasingly apparent.

### FOREST UTILISATION AND ENGINEERING

Dr. Chalk undertook the teaching in Forest Utilisation in the continued absence of Colonel A. H. Lloyd. Special attention was again devoted to the practical aspects of timber extraction and saw-milling under war conditions, during the excursions and vacation tours. Visits were again made to the Wheatley sawmill, and to the mills and extraction operations of the Forestry Companies of the Royal Engineers in the Forest of Dean, where Major Pollard Urquhart and Captain Rowney, both of whom studied forestry at the Imperial Forestry Institute, kindly demonstrated. The post-graduate Forestry students undertook special studies at the Forest Products Research Laboratory at Princes Risborough, and three visits were paid by the other students.

The excursions included visits to the Wood Distillation plant of Messrs. Goldsworthy in the Forest of Dean and to the factory of Messrs. Wm. Birch at High Wycombe.

The post-graduate (Forestry) students carried out a road alignment and quantity estimate in Bagley Wood under Mr. A. Foggie.

## SURVEYING

Mr. O. H. Chilton gave the regular course in surveying to the first year students.

## LIBRARY

Fewer items were received and fewer lent than last year. The figures for accessions were 1,837 and 1,682, and for loans 3,100 and 3,060 in 1941-42 and 1942-43 respectively. It may be noted, however, that though loans to students dropped from 380 to 158, those to visitors and to persons outside Oxford rose from 224 to 452. Among the accessions there were 61 books (two bought out of the invaluable Brooks Fund) and 806 separate issues of periodicals; the Bureau provided 178 items, 224 were received on request, chiefly from the United States, and 22 were presented. The number of current periodicals received came to 90, six fewer than last year; eight German journals are included in this total. Fifty-one new separate series of bulletins and reports were opened, two more than last year; these high figures indicate the current output of literature bearing on forestry which has to be taken into consideration. The Russian material, negotiations for which were pending when the last report was made, has now begun to arrive, and comprises both books and periodicals. It has already proved extremely useful. We have yet to learn whether our publications, sent in exchange, have reached Leningrad.

Visitors were more numerous, 282 as against 220; of these, 31 were members of H.M. and Allied Forces, *e.g.* British, New Zealanders, Americans, Poles and Norwegians. The foreigners were gratified to find we had literature in their own languages (thus one Polish airman who had been a student at the Lwow Institute found its publications here). Practically all the visitors needed technical information, and there were 29 enquiries by post and telephone, several being also from officers of the Forces. Letters sent out numbered 378 and those received 370; the bulk of this correspondence is in connection with requests for publications from other institutions. Readers used the library on 1,408 occasions (staff 537, Bureau 422, visitors 260, students 153).

Work has continued on the new subject and author catalogues, the numbers of filed cards now being 15,500 and 10,200 respectively, as compared with approximately 4,000 and 1,500 in 1941. It is difficult to keep up with the filing of these large numbers of cards with the present staff, and a considerable number are pending. The copying of the 1939 intake from Current Monthly Record, begun in June, 1942, by two part-time typists, was completed in December of the same year. A part of this material is already in the catalogue. A start was next made on the 1936-38 cards, numbering approximately 10,000, and about one-sixth of this material had been typed and checked by the end of the year under review.

In connection with the visit of Dominion officers in January, an exhibition of literature was arranged, partly appertaining to the countries represented and partly of general interest.



Some progress has been made in dealing with the mass of duplicate material, collected over many years and for the most part unsorted, and the residue has been arranged. Some of the material was presented to other libraries, some was sold, and some sent for salvage. Lack of time and space prevented the completion of this overdue measure, but it is hoped to resume it before long.

Donors of publications to the library include: The Royal African Society, the Forest Products Research Laboratory, Bodley's Librarian, the Imperial Mycological Institute, Dr. C. F. C. Beeson, Mr. M. B. Raizada, Major C. P. Ackers, Dr. S. E. Wilson, Dr. N. Chrystal, Dr. L. Chalk, Mr. C. E. Sexton and Professor McLean Thompson of the University of Liverpool; also Professor Tor Jonson of Stockholm and Dr. Douglas Melin of Uppsala, whose gifts of certain early papers of their own, much needed and otherwise unobtainable, should be specially mentioned. The help of the Foreign Office and of the British Council in acquiring these and other important Swedish and Russian publications is very gratefully acknowledged. One valuable anonymous gift of books was also received. The scientific institutions in various parts of the Empire, in the United States and in South America, which, upon being asked for specific items, almost invariably presented them without charge or exchange, are too numerous to name here, although a record is carefully kept. The interest shown by all our benefactors in enriching the library and extending its utility is a source of signal encouragement.

## FINANCE

The audited accounts of the Department will be published in the *Oxford University Gazette*. The following is a summary of income and expenditure for the year:—

### GENERAL ACCOUNT

*Income*: Forestry Commission, £2,861; Colonies, £4,673; Dominions, Burma and others, £167; other receipts, £48. Total Income, £7,749.

*Expenditure*: Staff Salaries and Pension Contributions, £6,546; Instructional Supplies, £14; Travelling, £289; Administrative and Miscellaneous Expenses, £880; Instalment on loan from Capital Account, £50. Total Expenditure, £7,779. (Expenditure exceeds income by £30.)

H. G. CHAMPION,

*Professor of Forestry*

(on behalf of the Committee for Forestry).

## APPENDIX I

## LIST OF STAFF

## I. STAFF ENGAGED IN INSTRUCTION AND RESEARCH

- PROFESSOR H. G. CHAMPION, M.A. (Oxon.), Fellow of St. John's College. Tropical Forestry, Silviculture and Policy.
- \*L. CHALK, M.A., D.Phil. (Oxon.), University College. Wood Structure and Properties.
- \*W. R. DAY, B.Sc., M.A. (Oxon.), Exeter College. Pathology, Forest Hygiene, Economics and Statistics.
- \*A. H. LLOYD, M.C., M.A. (Oxon.), Exeter College. Forest Engineering and Utilization. (Absent on military duty from 1st September, 1939.)
- A. FOGGIE, B.Sc. (Edin.). Forest Management and Mensuration.
- †E. W. JONES, M.A. (Oxon.), Ph.D. (Cantab.), Magdalen College. Silviculture and Ecology.
- J. P. M. BRENNAN, B.A. (Oxon.), Brasenose College. Forest Botany.

II. STAFF ENGAGED SOLELY IN RESEARCH FOR  
THE FORESTRY COMMISSION

- R. G. SANZEN-BAKER, B.Sc. (Edin.), Forestry Commission Research Officer for England and Wales. Silviculture.

III. STAFF OF OTHER UNIVERSITY DEPARTMENTS  
ASSISTING IN INSTRUCTIONAL WORK

- R. N. CHRYSTAL, D.Sc. (Edin.), Hon. M.A. (Oxon.). Forest Zoology.
- A. C. HOYLE, B.Sc., M.A. (Oxon.), Pembroke College. Forest Botany and Ecology.
- O. H. CHILTON, M.A., M.Sc. (Lond.). Reader in Surveying.
- C. G. T. MORISON, M.A. (Oxon.). University Reader in Soil Science. Student of Christ Church. Soil Science.
- G. R. CLARKE, B.Sc., M.A. (Oxon.), Oriel College. Demonstrator in Soil Science, School of Rural Economy. Soil Science.

## IV. OTHER STAFF

- Acting Secretary-Accountant: Miss H. M. EDWARDS.
- Acting Assistant Secretary: Miss J. M. POLLARD.
- Librarian: Miss G. GUINEY.
- Assistant Librarian: Miss I. S. T. ASPIN, M.A. (Oxon.).

\* These members of the Staff have the status of University Demonstrators, having been reappointed as such with effect from the following dates: Mr. Lloyd, 1/8/39; the remainder, 1/8/41.

† This member of the Staff appointed University Demonstrator on 1/10/40.





